



high reliability
discrete semiconductor
up-screening

Q4-2020



www.centalsemi.com

vision statement

we aspire to be the preferred manufacturer of
the most innovative discrete semiconductor solutions
in the industry

Your Trusted
Source for
over 46 years

CentralTM
Semiconductor Corp.

Discretes do MatterTM

core values

purpose

Customer satisfaction is our passion.

innovation

Overcome challenges through
creative solutions.

enthusiasm

The resolve to achieve excellence.

trust

Empower to succeed.

teamwork

Results through dynamic
collaboration.

heritage

Exceptional past,
exciting future.



A Heritage of Success

An outstanding reputation:

Since 1974, Central Semiconductor has manufactured innovative discrete semiconductors for OEM products worldwide. Devices are available in surface mount, through-hole and bare die. Epoxy molded, glass passivated, and hermetically sealed packages are available for a broad range of device types. Central maintains ISO 9001:2015 certification.

Devices include:

- Small signal transistors
- Bipolar power transistors
- MOSFETs/JFETs
- EOS protection devices (TVS)
- Diodes/Rectifiers
- Thyristors
- Multi Discrete Modules (MDM™)



Central Semiconductor has the capability to screen COTS devices to a variety of standards.

A Heritage of Success

The highest quality and reliability:

To ensure devices meet the highest quality expectations, Central is an ISO9001:2008 certified manufacturer, currently transitioning to ISO9001:2015. Our devices are RoHS2 and REACH compliant with quality data readily available from our website.

Our ongoing commitment:

Central Semiconductor is committed to designing and manufacturing innovative quality products, and delivering on time, with outstanding service and support, at competitive prices. Our team is driven to exceed customers' expectations. We appreciate your support and partnership in helping to realize our mutual objectives.



High Reliability Devices

Bare Die

Central has the capability to perform the majority of up-screen testing in-house.



MIL-PRF 38534 (Class H and K equivalent)

MIL-PRF-19500 (Class HC and KC equivalent)

- 100% of die inventory is held in the U.S.
- 100% of Class H equivalent testing is performed in-house
- Customer-specific up-screening

Packaged Devices

Central Semiconductor has the capability to up-screen COTS devices to meet customers' requirements.



MIL-PRF-19500

- EX devices provide up-screening to JANTX equivalents
- J-Lite and JX-Lite up-screening is available with modified test flows
- Customer-specific up-screening

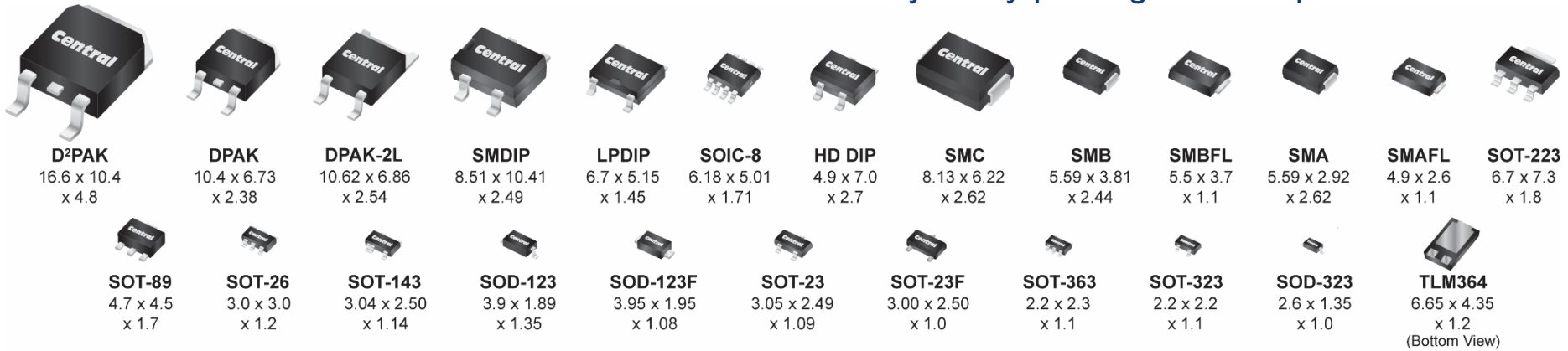
Baseline: Broad Range of Standard Products

- ◆ Small Signal Transistors
 - Low $V_{CE(SAT)}$
 - General Purpose Amplifier/Switch
 - High Current/High Voltage
 - Low Noise
 - Darlington
 - RF Oscillator
 - Chopper
- ◆ Bipolar Power Transistors
 - Low $V_{CE(SAT)}$
 - General Purpose Amplifier/Switch
 - High/ Extremely High Voltage
 - Darlington
- ◆ MOSFETs
 - 20V - 800V, 100mA – 12A
Single and Dual N-Channel &
P-Channel Enhancement-mode
- ◆ Thyristors
 - Triacs, Diacs, SCRs
- ◆ Diodes
 - Fast Switching
 - Schottky
 - Low and Ultra Low Leakage
 - Zener, and TC Zener
 - Current Limiting
- ◆ Rectifiers
 - General Purpose, Fast, Super Fast, UltraFast and HyperFast Recovery
 - Schottky
 - Bridge
- ◆ Protection Devices
 - Transient Voltage Suppressors
- ◆ Silicon Carbide Devices
 - Schottky Rectifiers, Bare Die
- ◆ Multi Discrete Module (MDM™)
 - MOSFET/Rectifier combinations
 - Transistor/Rectifier combinations

Extensive Range of SMD Package Options

> 1.0mm Profile

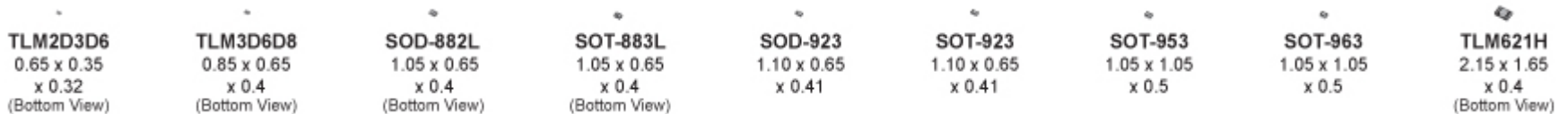
From the larger power packages to the smallest types, Central can satisfy many package size requirements.



< 1.0mm Profile



< 0.5mm Profile



Extensive Range of Through-hole Package Options

Hermetically sealed metal can packages



TO-3



TO-66



TO-18



TU-39



TO-72



TO-78

Axial leaded packages



DO-35



DO-41



GPR-1A



GPR-4AM

Epoxy molded packages



TO-92



TO-237



TO-220



TO-220FP



TO-202



TO-116

Ideal Solutions for High Reliability requirements

Markets:

- Military
- Medical
- Aerospace
- Industrial



Applications:

Power Management

Circuit Protection

Products:

- MOSFETs
- Transistors
- Schottky Rectifiers
- Zener diodes

- TVS
- Zeners

Applications: Avionics & Comms. Equipment

Central's up-screened products are ideal for the most demanding avionics and communications applications:

- Aircraft control boards
- Radar systems
- Passive optical networks (GPON, EPON)
- Transceiver equipment
- Cabin entertainment and communications systems



High Reliability up-screening

Testing capabilities:



Thermal stream testing



Temperature cycle testing



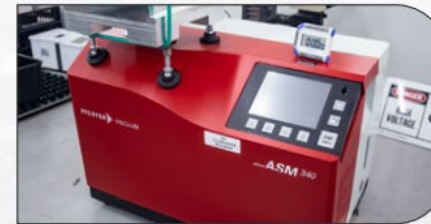
Particle Impact Noise Detection (PIND)



Burn-in testing



High temperature & humidity testing



Fine leak testing



Scanning Electron Microscopy (SEM)



Highly-accelerated stress testing (HAST)



Wire pull & die shear testing

All tests performed to MIL-STD-750 test methods. Central provides dependable management of the work flow with accurate device identification throughout the process.

High Reliability up-screening

Testing capabilities:



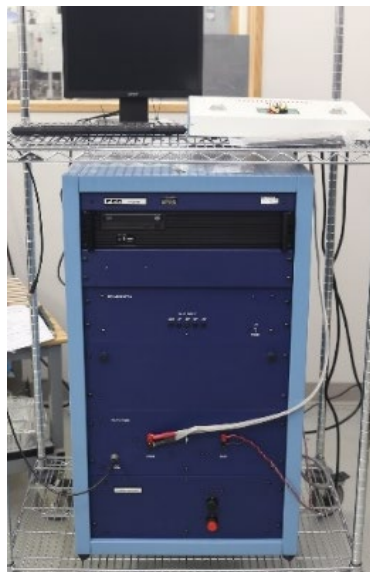
X-Ray



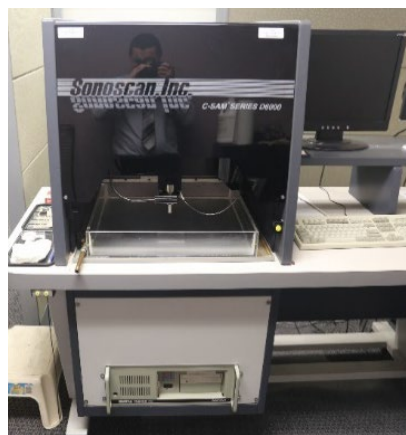
One Box test chambers



PIND Tester



Multiple waveform surge tester



C-SAM



De-cap station



Quality by Design

Central's designs provide superior performance and reliability by using superior materials in the construction of devices. Central's devices meet or exceed commercial performance standards and outperform industry expectations.



Benefits:

- Deal directly with Central Semiconductor
- Single point of contact from development through test
- Commitment to on-time delivery
- Receptive to custom test requirements

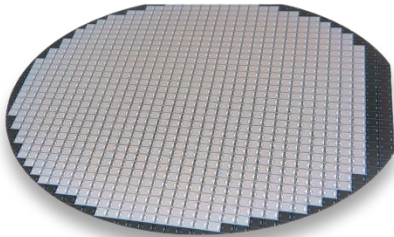
High Reliability up-screening

Fast, thorough quoting process

Central Semiconductor has made the quote process easy:

- 1) Contact your Central Sales representative or call 631-435-1110.
- 2) You will receive a quote within 1 to 5 business days.
(complex requests may take longer)

Attention to every detail is Central's highest concern. Central is committed to exceeding your expectations and earning your business on every order.



Typical bare die up-screening process for MIL-PRF-38534

MIL-PRF-38534 Evaluation Elements						
Sub Group	Class		Test	MIL-STD-883		Acceptance Quantity
	K	H		Method	Conditions	
1	X	X	Element electrical			100%
2	X	X	Visual Inspection	2010 1/2069 1/2070 1/2072 1/2073		100%
3	X	X	Internal visual	2010 1/2069 1/2070 1/2072 1/2073		10 (0)
4	X		Temperature Cycling	1010	C	2/ 10 (0)
	X		Mechanical shock or	2002	B, Y1 direction	
			Constant Acceleration	2001	3,000 g's, Y1 direction	
	X		Interim electrical			
	X		Burn-in	1015	240 hours minimum at +125°C	
	X		Post burn-in electrical			
	X		Steady-state life	1005		
	X	X	Final electrical			
5	X	X	Wire bond evaluation	2011		10 (0) wires or 20 (1) wires
6	X		SEM	2018 1/2077		See method 2018 of MIL-STD-883 or method 2077 of MIL-STD-750

1/ MIL-STD-750 methods.

2/ A minimum of 10 die per wafer lot. For Class K, this quantity must contain 3 die from each wafer evaluated.

High Reliability up-screening

MIL-PRF-19500

Typical bare die up-screening process for MIL-PRF-19500

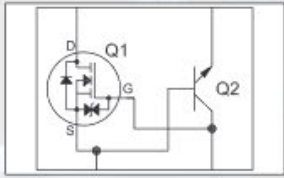
MIL-PRF-19500 Evaluation Elements						
Sub Group	Class		Test	MIL-STD-750		Acceptance Quantity
	KC	HC		Method	Conditions	
1	X	X	Electrical test			100%
2	X	X	Visual inspection	2069 2070 2072 2073		100%
3A	X	X	Internal/die visual inspection	2069 2070 2072 2073		45 (0) for class KC, 22 (0) for class HC
3B	X	X	Sample assembly			45 pieces min for class KC, 22 pieces min for class HC



4							45 (0) for class KC, 22 (0) for class HC
	X	X	Temperature cycling			1051	C
	X		Mechanical shock or Constant acceleration			2016 2006	Y1 axis direction Y1 axis direction
	X	X	Electrical test (read/record)				Group A, subgroups 2, 3, 4
	X	X	HTRB				Screen 10
	X	X	Electrical test (read/record)				Group A, subgroup 2
	X	X	Burn-in				Screen 12
	X	X	Electrical test (read/record)				Group A, subgroups 2, 3
	X		Steady-state life Transistors Power FETs Diodes/rectifiers			1039 1042 1038	B A A or B
	X		Electrical test (read/record)				Group A, subgroups 2, 3, 4
5A	X	X	Wire bond evaluation			2037	As applicable
5B	X	X	Die shear evaluation			2017	22 (0) wires or 38 (1) wires
6	X		SEM			2077	As applicable
7	X		RHA Total dose			1019	See test method 2077
	X		Neutron irradiation			1017	Sample size per the specification sheet
							5 (0) or 10 (1)
							Subgroup 3 applies to class KC only

Custom High Reliability Solutions

Your vision is our mission. Central excels at listening to customers' challenges and designing custom solutions that other manufacturers have no interest in pursuing. **Just ask.**



Standard options include:

- Electrical parameter screening
- Custom wafer diffusion and metallization
- Standard/customer-specific testing and up-screening



Super Industrial™ solutions include:

- Customer-specific high reliability testing
- Custom interconnect
- Custom packaging



Spacellite™ solutions:

- Designed to function effectively in the harsh environment of space
- Specialized testing to insure reliability and lower cost
- Ideal for low Earth orbit (LEO) applications

Part numbering:

MIL-PRF-19500 and MIL-PRF-38534 Equivalents

Die:

H = MIL-PRF-38534 Class H equivalent (Ex: CP318V-**H**2N5682-CM)

K = MIL-PRF-38534 Class K equivalent (Ex: CP318V-**K**2N5682-CM)

HC = MIL-PRF-38534 Class H equivalent (Ex: CP318V-**HC**2N5682-CM)

KC = MIL-PRF-38534 Class H equivalent (Ex: CP318V-**KC**2N5682-CM)

JANTX equivalent:

EX = MIL-PRF-19500 equivalent (Ex: EX2N2222A)

J-Lite / JX-Lite:

JL = J-Lite test flow

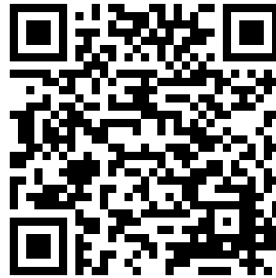
JXL = JX-Lite test flow

Customer Specified:

CEN1234 = Customer specified custom test flow

Up-screening Guide

Scan this QR Code to download
the brochure in PDF format



or visit:

<https://www.centrasemi.com/upscreeningpdf>

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Q2-2020



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